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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,873	06/28/2006	Yuji Hiroshige	59584US004	1755
32692	7590	07/07/2008		
3M INNOVATIVE PROPERTIES COMPANY				
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ST. PAUL, MN 55133-3427				
EXAMINER				
REDDY, KARUNA P				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
07/07/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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LegalDocketing@mmm.com

### Office Action Summary

**Application No.**

10/596,873

**Applicant(s)**

HIROSHIGE ET AL.

**Examiner**

KARUNA P. REDDY

**Art Unit**

1796

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 4-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/13/2008 has been entered.

Claim 1 is amended; and claims 4-6 are withdrawn as being drawn to non-elected invention. Claims 1-8 are currently pending in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-3 and 7-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites "(meth)acrylic polymer not

copolymerized with an organophosphorus compound". However, there is support only for "may not be substantially copolymerized with the (meth)acrylic monomer" which indicates to one skilled in the art that the organophosphorus is copolymerizable to a certain degree with a (meth)acrylate monomer.

Claims 2-3 and 7-8 are subsumed by this rejection.

***Claim Rejections - 35 USC § 102/103***

5. Claims 1-3 and 7-8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamazaki et al (JP 2000-313785).

Yamazaki et al disclose a resin composition for fire-resistant molding materials suitably used as a sheet (paragraph 0001). The flame retardant molding material comprises a radically polymerizable resin containing aluminum hydroxide and phosphoric ester methacrylate (paragraph 0007). Other compounds that are copolymerizable with phosphoric ester methacrylate can be included (paragraph 0023). Examples of copolymerizable monomers include styrene, methyl (meth)acrylate, ethyl (meth)acrylate (paragraph 0025). The phosphoric ester (meth)acrylate is present in 5-80% by weight of the resin and it is desirable that the other copolymerizable monomer is present in an amount of 20-95% by weight. It is desirable to use 100-300 parts by weight of aluminum hydroxide to 100 parts of the resin (paragraph 0028) and reads on the vol% of metal hydroxide of claim 1. Furthermore, when the aluminum hydroxide content is more than 300 parts by weight relative to 100 parts by weight of radically polymerizable resin, molding performance properties such as flexibility may be poor i.e., Yamazaki et al recognize the importance of flexibility accorded to molded products

(paragraph 0028). The fire retardant molding composition of the present invention is suitable for materials for moldings requiring good fire resistance such as sheets (paragraph 0034). See example 1, where in the product is compounded with mono(2-methacryloyloxyethyl) acid phosphate and di(2-methacryloyloxy) acid phosphate to obtain a radical polymerizable resin.

Yamazaki et al are silent with respect to its use as a thermally conductive flexible sheet and the high flame/fire-retardancy associated with it.

However, in light of the fact that prior art teaches / discloses essentially the same composition as that of the claimed and is useful for molding into a fire retardant sheet which is flexible, one of ordinary skill in the art would have a reasonable basis to believe that the flame retardant sheet formed using the composition of prior art exhibits essentially the same properties i.e. would be thermally conductive. Since PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobviousness difference. See *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980).

Even if properties of the flexible flame retardant sheet of instant claims and examples of Yamazaki et al are not the same, it would still have been obvious to one of ordinary skill in the art to make flame retardant sheet having the claimed properties because it appears that the references generically embrace the claimed flame retardant sheet and the person of ordinary skill in the art would have expected all embodiments of the reference to work. Applicants have not demonstrated that the differences, if any, between the claimed flexible flame retardant sheet and the flame retardant sheet of prior art give rise to unexpected results.

***Response to Arguments***

6. Applicant's arguments filed 5/13/2008 and 6/13/2008 with respect to prior art rejection in paragraph 4 and response to arguments in paragraph 5 of office action mailed 2/13/2008 have been fully considered but they are not persuasive. Specifically, applicant argues that (A) (meth)acrylic polymer is not copolymerized with an organophosphorous compound, and therefore the claimed organophosphorous halogen-free flame retardant is a separate chemical compound from the claimed (meth)acrylic polymer. The Patent Office admits that Yamazaki discloses phosphoric ester methacrylate i.e. an organophosphorous compound which is copolymerized with styrene, methyl (meth)acrylate, ethyl (meth)acrylate. Applicant therefore respectfully submits that Yamazaki cannot anticipate or make obvious applicant's presently claimed invention, at least because the Patent Office has not shown that Yamazaki et al disclose, teach or suggest applicant's presently claimed (meth)acrylic polymer that is not copolymerized with an organophosphorous compound; (B) patent office alleges that, because PTO cannot conduct experiments, it has shifted to the applicant, burden of showing that Yamazaki et al.'s composition inherently includes hydrated metal compound in an amount of 40-90 vol%. Applicant respectfully disagrees with the Patent Office, and respectfully resubmits that the Patent Office has not properly met its burden of establishing a *prima facie* case of inherency based on Yamazaki et al; (C) it is improper for the Patent Office to cite a density for aluminum hydroxide of 2.4 g/cm<sup>3</sup> and, without providing on the record any evidence found within the disclosure of Yamazaki et al. or within the knowledge of a person of ordinary skill in the art related to the density of the radical polymerizable resin, engage in speculation as to the volume percent of

aluminum hydroxide corresponding to a mixture of 100 to 300 parts by weight of aluminum hydroxide to 100 parts by weight of radical polymerizable resin. Absent evidence in the record regarding the density of the radical polymerizable resin disclosed by Yamazaki et al., Applicant respectfully submits that it is impossible to calculate a volume percentage of aluminum hydroxide as an amount based on the total volume of the composition (i.e. aluminum hydroxide plus radical polymerizable resin) using only the density value provided for aluminum hydroxide; and (D) examiner is respectfully invited to provide, on the record, a detailed calculation showing the mathematical basis for determining a volume percentage of a mixture of aluminum hydroxide and radical polymerizable resin in an amount specified by weight using only a density value for aluminum hydroxide, without specifying a density value for the radical polymerizable resin.

With respect to (A), it is noted that present claims are directed to a thermally conductive fire-retardant flexible sheet and not a composition. Applicant's attention is drawn to specification of present disclosure (page 9, lines 16-18 and page 11, lines 28-30) where it states that the thermally conductive sheet is produced by polymerizing a mixture containing a halogen-free flame retardant and that the sheet is formed in an inert atmosphere of nitrogen in order to prevent inhibition of polymerization by oxygen. It is the examiner's position that, sheet of present claims when formed from a composition containing copolymerizable organophosphorus compound comprises a polymer of polymerizable organophosphorus compound and a methacrylate monomer. Applicant has not provided any evidence to support the argument that thermally conductive sheet comprises a copolymerizable organophosphorous halogen-free flame retardant which is a separate chemical compound from the claimed (meth)acrylic polymer. Furthermore

See example 1 of Yamazaki et al, where in the product is compounded with mono(2-methacryloyloxyethyl) acid phosphate and di(2-methacryloyloxy) acid phosphate to obtain a radical polymerizable resin i.e. organophosphorus compound is in fact a separate compound from (meth)acrylate polymer.

With respect to (B), (C) and (D), applicant's attention is drawn to paragraphs 4 and 5A of office action mailed 2/13/2008. Specifically, composition of Yamazaki et al used to prepare flame-retardant sheet contains from 100 to 300 parts by weight of aluminum hydroxide per 100 parts by weight of resin. Given that the range for wt% of monomers that form 100 parts by weight of polymeric resin is large, density of aluminum hydroxide is  $2.4 \text{ g/cm}^3$ , and the composition contains substantially similar components as the present claims and is used to form a flame-retardant sheet, volume percent of aluminum hydroxide in the total composition of Yamazaki et al is certainly within the range of present claims. It is noted that while present claims use volume percent, prior art discloses weight parts. It is well known in the art that density = mass/volume. Since PTO cannot conduct experiments to obtain density of the composition of Yamazaki et al to calculate volume equivalent for weight parts of the total composition of Yamazaki et al, burden is shifted to the applicant to show that the weight parts disclosed by prior art of Yamazaki et al is different from the presently claimed volume percent of aluminum hydroxide in the total composition, specially in light of the fact that composition of Yamazaki et al contains substantially similar components and is used to make flame-retardant sheet.

### ***Conclusion***



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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